

CLAIMS

What is claimed is:

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1. A method for equalization in a communications system, the method comprising:
utilizing a block code based error correction scheme in a modulation system of the
communication system; and

10 removing cursor inter-symbol interference within an error code correction word to
make code word decision with minimum error power-based criteria in the block code based
error correction scheme.

2. The method of claim 1 wherein removing cursor inter-symbol interference further
comprises utilizing a decision feedback equalization filter to remove symbol interferences
15 from previous error correction code words.

3. The method of claim 2 wherein removing cursor inter-symbol interference further
comprises utilizing distortion filtering in the decision feedback equalization filter.

20 4. The method of claim 3 wherein utilizing distortion filtering further comprises
inserting a matrix multiplication-based filter after a feed forward equalizer filter and a
feedback filter in the modulation system for symbol interference from the symbols in
previous error correction code words.

5. The method of claim 3 wherein removing cursor inter-symbol interference further comprises adding scalar terms for each error correction code word to a decision metric of a real part of a projection of the filtered symbols to the error correction code words.

5 6. A system for equalization in a communications system, the system comprising:
a modulation system utilizing a block code based error correction scheme; and
a feedback equalization filter provided within the modulation system for removing
cursor inter-symbol interference within an error code correction word to make code word
decision with minimum error power-based criteria in the block code based error correction
10 scheme.

7. The system of claim 6 wherein the decision feedback equalization filter removes
symbol interferences from previous error correction code words.

15 8. The system of claim 7 wherein the decision feedback equalization filter further
comprises a distortion filter.

9. The system of claim 8 wherein the distortion filter further comprises a matrix
multiplication-based filter inserted after a feed forward equalizer filter and a feedback filter
20 for symbol interference from the symbols in previous error correction code words.

10. The system of claim 8 further comprising a decision metric for the decision
feedback equalization filter, wherein scalar terms are added for each error correction code

word to the decision metric of a real part of a projection of the filtered symbols to the error correction code words.

11. A method for equalization in a communications system, the method comprising:
5 performing block code based error correction during signal modulation in a communications system; and
making code word decisions with minimum error power-based criteria during the block code based error correction with a decision feedback equalization filter that removes cursor inter-symbol interference within an error code correction word.

10 12. The method of claim 11 wherein making code word decisions further comprises utilizing the decision feedback equalization filter to remove symbol interferences from previous error correction code words.

15 13. The method of claim 12 wherein making code word decisions further comprises utilizing a distortion filter in the decision feedback equalization filter.

20 14. The method of claim 13 further comprising inserting a matrix multiplication-based filter after a feed forward equalizer filtering and a feedback filter for symbol interference from the symbols in previous error correction code words for the distortion filter.

15. The method of claim 13 further comprising utilizing a decision metric for the decision feedback equalization filter, wherein scalar terms are added for each error correction code word to the decision metric of a real part of a projection of the filtered symbols to the error correction code words.